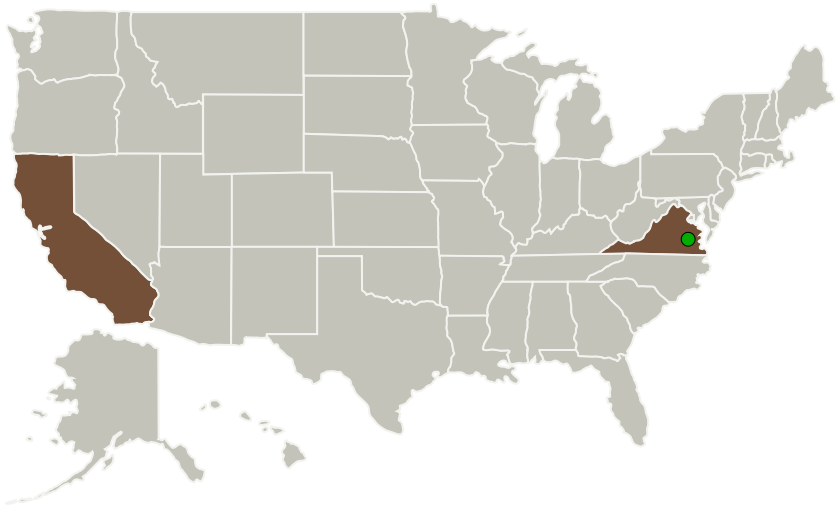
A Queuing Model-Based System for Triggering Traffic Flow Management Algorithms, Phase I

Completed Technology Project (2010 - 2010)

Project Introduction

Next generation air traffic management systems are expected use multiple software tools and quantitative methods for managing traffic flow in the National Airspace. NASA and other aerospace research centers are involved in developing advanced numerical algorithms for strategic traffic flow management. These algorithms can be invoked at fixed time intervals, or can be employed whenever adverse traffic flow conditions occur. In order to avoid spurious responses, the control algorithms should be used only when actual traffic flow problems are likely to arise, and not in response to normal flow variations. Queuing models describe the aggregate stochastic behavior of the national airspace, and can provide not only mean flow characteristics, but also the expected variations. This proposal advances the development of a queuing model-based methodology for triggering traffic flow management algorithms. The approach , based on the measured state of the national airspace system. The approach exploits recently-developed queuing models of the NAS, together with recent advances in estimation theory. Phase I research will demonstrate the feasibility of developing the traffic flow management triggering system using a simulation model of the national airspace system. Phase II research will integrate this methodology with NASA's traffic flow management algorithms, and assess the overall system performance n the ACES environment. Algorithms and software developed under the SBIR project will be delivered to NASA at the end of Phase II work.

Primary U.S. Work Locations and Key Partners



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Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
Optimal Synthesis, Inc.	Lead Organization	Industry Small Disadvantaged Business (SDB)	Los Altos, California
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
California	Virginia

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Summary: A Queuing Model-Based System for Triggering Traffic Flow Management Algorithms, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/140538)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Optimal Synthesis, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

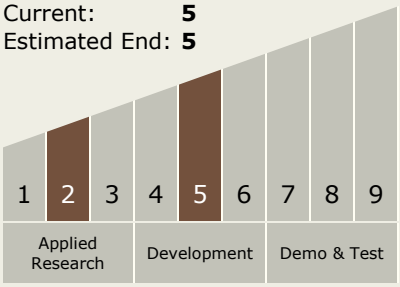
Carlos Torrez

Principal Investigator:

Padmanabhan K Menon

Technology Maturity (TRL)

Start: **2**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX16 Air Traffic Management and Range Tracking Systems
  - TX16.3 Traffic Management Concepts

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System